

Appl No. 10/574,152
Amdt. Dated December 2, 2009
Reply to Office Action of June 2, 2009

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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A liquid emitting apparatus including a plurality of liquid chambers for storing liquid arrayed in a line print head wherein each liquid chamber includes two or more pressure generating elements provided in said liquid chamber for pressurizing the liquid stored in said liquid chamber, an emitting port for emitting the liquid pressurized by said pressure generating elements in the form of liquid droplets, and an emission control circuit for varying a current value supplied to at least one of said pressure generating elements relative to one of the other pressure generating elements to thereby control an angle of emission of said liquid droplets from said emitting ports; wherein

with a non-zero current supplied to one of said pressure generating elements as a reference current, said emission control circuit supplies a current substantially equal to said reference current or a current having a current value difference less than $\pm 10\%$ from said reference current, to one or more of the pressure generating elements other than the pressure generating element supplied with said reference current, and further wherein none of the liquid chambers in the line print head has a pressure generating element that receives a current having a current value difference that is greater than 10 % from the corresponding reference current, and further comprising circuitry for limiting a current value difference to less than 10% for ejecting elements when no ejection variation is intended.

2. (Previously Presented) The liquid emitting apparatus according to claim 1 wherein said emission control circuit supplies a current having a current value difference less than $\pm 8\%$ with respect to said reference current to the one or more of the pressure generating elements other than said pressure generating element supplied with said reference current.

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3. (Previously Presented) The liquid emitting apparatus according to claim 1 wherein the emitting ports are arranged side-by-side in a line.

4. (Currently Amended) A liquid emitting method for printing with a liquid emitting apparatus including a plurality of liquid chambers for storing liquid arrayed in a line print head wherein each liquid chamber includes two or more pressure generating elements provided in said liquid chamber for pressurizing the liquid stored in said liquid chamber, an emitting port for emitting the liquid pressurized by said pressure generating elements in the form of liquid droplets, and an emission control circuit for varying a current value supplied to at least one of said pressure generating elements relative to one of the other pressure generating elements to thereby control an angle of emission of said liquid droplets from said emitting ports; wherein

with a non-zero current supplied to one of said pressure generating elements as a reference current, a current substantially equal to said reference current or a current having a current value difference less than $\pm 10\%$ from said reference current, is supplied to one or more of the pressure generating elements other than the pressure generating element supplied with said reference current, and further wherein none of the liquid chambers in the line print head has a pressure generating element that receives a current having a current value difference that is greater than 10 % from the corresponding reference current during a printing operation, and further comprising circuitry for limiting a current value difference to less than 10% for ejecting elements when no ejection variation is intended.

5. (Previously Presented) The liquid emitting method according to claim 4 wherein a current having a current value difference less than $\pm 8\%$ with respect to said reference current is

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supplied to the one or more of the pressure generating elements other than said pressure generating element supplied with said reference current.

6. (Previously Presented) The liquid emitting method according to claim 4 wherein the emitting ports are arranged side-by-side in a line.

7. (Previously Presented) The liquid emitting apparatus according to claim 1, wherein said emission control circuit is comprised of one or more switches and a variable resistance element.

8. (Previously Presented) The liquid emitting method according to claim 4, wherein said emission control circuit is comprised of one or more switches and a variable resistance element.

9. (Previously Presented) The liquid emitting apparatus according to claim 7, wherein the current value applied to said one or more of the pressure generating elements other than the pressure generating element supplied with said reference current is varied relative to the variation of the resistance of said variable resistance element.

10. (Previously Presented) The liquid emitting method according to claim 8, wherein said step of supplying a substantially equal current to one or more of the pressure generating elements other than the pressure generating element supplied with said reference current includes varying the resistance of the variable resistance element.

11. (Previously Presented) The liquid emitting apparatus according to claim 7, wherein said emission control circuit is comprised of the variable resistance element connected to a first terminal of each of said pressure generating elements via a first switch, and said variable resistance element is selectively connected to a first potential power source and a second potential power source different via a second switch.

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12. (Previously Presented) The liquid emitting method according to claim 8, wherein said emission control circuit is comprised of the variable resistance element connected to a first terminal of each of said pressure generating elements via a first switch, and said variable resistance element is selectively connected to a first potential power source and a second potential power source different via a second switch.

13. (Previously Presented) The liquid emitting apparatus according to claim 11, further wherein said pressure generating element supplied with a non-zero reference current has a second terminal thereof connected to a third potential power source, and each of said one or more pressure generating elements other than the pressure generating element supplied with said reference current has a second terminal thereof selectively connected to a fourth potential power source via one or more third switches.

14. (Previously Presented) The liquid emitting method according to claim 12, further wherein said pressure generating element supplied with a non-zero reference current has a second terminal thereof connected to a third potential power source, and each of said one or more pressure generating elements other than the pressure generating element supplied with said reference current has a second terminal thereof selectively connected to a fourth potential power source via one or more third switches.

15. (Previously Presented) The liquid emitting apparatus according to claim 13, wherein said first and fourth potential power sources are a ground level.

16. (Previously Presented) The liquid emitting method according to claim 14, wherein said first and fourth potential power sources are a ground level.

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17. (Previously Presented) The liquid emitting apparatus according to claim 11, wherein said first and second switches are respectively controlled via first and second switch control circuits, said first control circuit causing the variable resistance element to be connected to and disconnected from said pressure generating elements, and said second control circuit determining whether the variable resistance element is connected to said first or said second potential power source.

18. (Previously Presented) The liquid emitting method according to claim 12, wherein said first and second switches are respectively controlled via first and second switch control circuits, said first control circuit causing the variable resistance element to be connected to and disconnected from said pressure generating elements, and said second control circuit determining whether the variable resistance element is connected to said first or said second potential power source.